LAB talk

Laboratory perspectives from the inside out.

Common Communication Techniques Using a Different Provisionalization Approach

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Many articles have been written in the past decade, both in the United States and abroad, emphasizing the importance of routinely using a diagnostic wax-up and provisionals for a superior and more predictable restorative outcome. However, creating total smile designs is quite different from delivering a couple of crowns. Without sufficient communication, the former can be a difficult procedure with an unpleasant surprise at the end.

COMMUNICATION WITH PATIENTS

It is important that dental professionals understand the patients' preconceived ideas and interpretations of how they would like their smile to look. The reality is that esthetics is very subjective, and not all smiles are created equal, just as all tooth preparations are not created equal. The topic of communication is one of many that can become quite complicated. It is common to hear patients use different key words in an attempt to communicate. However, precisely what do "white," "natural," "straight," "big," and "small" mean to the patient who is describing these requests at that particular time? Do these words have the same meaning from patient to patient, dentist to dentist, and dental ceramist to dental ceramist? For example, one case (Figure 1A) was sent to two different dental laboratories with the same detailed prescription for a wax-up design. It is evident that the visions of each laboratory technician varied significantly (Figure 1B).

COMMUNICATION WITH LABORATORIES

The dentist must be aware of the capability and style of his or her laboratory technicians. As with all forms of art, the art of all technicians/ceramists differs in styles. Most dentists are not aware of who designs the wax-up. In many laboratories a designated technician performs only wax-ups on a daily basis. His or her talents and visions may vary from those of the ceramist who will actually fabricate the final smile in ceramic. Although the case presented in Figure 1A exhibits a challenging situation (ie, a lack of space between the two lateral incisors), each technician devised a different approach to overcome this issue.

The questions then become: Which wax-up will the patient and/or the dentist like the most? How will the function be for the patient with each restoration? What type of tooth reduction will be needed for this to be the final outcome? The typical procedure is to have one wax-up that can be followed to prepare the teeth and then fabricate the provisionals from a silicone mold. If the patient is dissatisfied with the provisional and would like a different version of the smile, it may require a different type of preparation; this necessitates additional chairtime, possibly further tooth reduction, and, at times, root canal therapy, as well as the fees associated with each.

While communication is a complex issue, it is an essential part of a satisfactory outcome. The ultimate goal is to prevent miscommunication or the wrong tooth preparation design. The best method to do so is to create a mock-up made from the wax-up over the existing teeth or restorations before reduction. In this way, if the patient is unhappy with the potential outcome, the wax-up can be altered and then repeated with another mock-up until the patient approves the design. The restorative dentist can then create an outcome-generated preparation design to facilitate the proper amount of space for the final ceramic restorations.

Figure 1A Preoperative view of a patient who presented for treatment (dentistry performed by Dr. Anita Tate, private practice, Atlanta, Georgia).

Figure 1B Two different laboratories designed wax-ups for the case (dentistry performed by Dr. Anita Tate, private practice, Atlanta, Georgia).

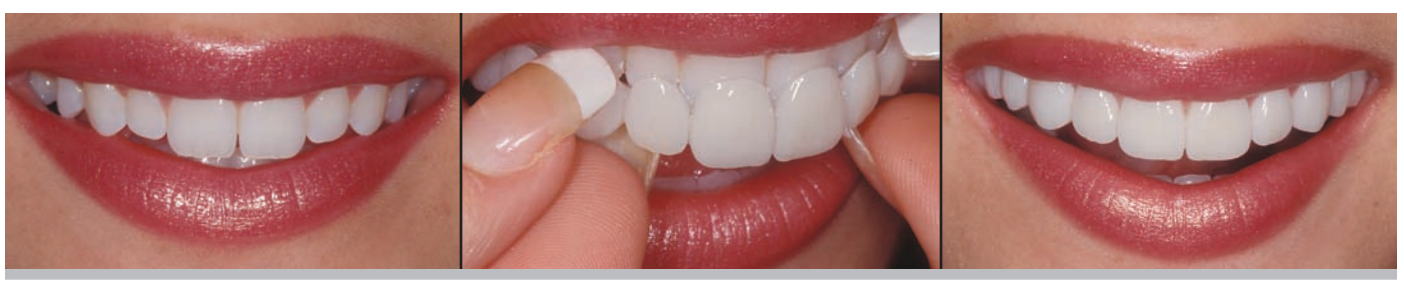

Figure 2 By inserting the laboratory-fabricated trial smile, the patient was able to consider phonetic function and show friends and family the appearance of the new teeth.

TOOLS FOR EFFECTIVE COMMUNICATION

There are critical communication tools that can be used between the dentist and the laboratory technician to maximize success. These include:

- Preoperative study models of upper and lower arches mounted in an articulator with face-bow.
- Preoperative clinical digital images (ie, smile and retracted view with a shade tab of the natural color displayed with it).
- Digital images of the desired shade tab adjacent to the prepared teeth. It is incredibly important for the technician to know the shade of the prepared teeth so that the correct ceramic system can be selected.
- Digital images (ie, smile and retracted view) of the provisional restoration, if used.
- Digital images of the patient's face.
- List of the desired expectations of the patient and the dentist.
- Three or more accurate impressions. Certain distortions are very smooth and unrecognizable, but the same type of distortion is unlikely to occur in three impressions. Having three impressions enables the technician to

Figure 3A Preoperative view of a patient dissatisfied with her smile.

Figure 3B View of the chairside fabrication of a trial smile (images courtesy of Adar DVD's *Trial Smile*, distributed by National Lab Network).

Figure 3C A patient with the mock-up trial smile in her mouth is able to see and feel what her new smile will be like at completion (image courtesy of Adar DVD's *Trial Smile*, distributed by National Lab Network).

Figure 4A View of a laboratory-fabricated provisional using composite (Venus) on the master model.

Figure 4B A restorative dentist fabricated a multilayer provisional using a cold-curing acrylic.

check the restorations in all three models for accuracy, thus allowing for the best fit of the restorations, resulting in less chairtime for the dentist at the seating appointment.

THE IMPORTANCE OF A TRIAL SMILE

The removable "trial smile" method is a useful communication tool. The benefits of using a trial smile in the pretreatment stage include avoiding patient disappointment and enhancing communication between the entire dental team for a successful outcome. With the trial smile, patients can see and feel the proposed changes to their teeth before tooth preparation, as well as see the new color in their mouths. The trial smile serves as a blueprint to allow the patient to experience what his or her new smile will be like. However, it is important and necessary that the ceramist who will be fabricating the final ceramics create a diagnostic wax-up for the trial smile and/or the trial smile itself. A great amount of detail needs to be applied to these restorations.

By inserting the trial smile (Figure 2), the patient is able to consider phonetic function, as well as remove and replace it in the mouth to show friends and family the appearance of the new teeth. It is important that the patient makes the final decision about the design of his or her trial smile. Esthetics are quite subjective and a matter of personal preference, emotional feelings, and personal opinion.

The dentist also can create a trial smile directly in the mouth. In the case of one female patient dissatisfied with her smile (Figure 3A), she felt the teeth were too short, the color too yellow, and that the soft tissue lacked symmetry. The ceramist created a wax-up of his vision of what the final outcome of the case should be. This is an extremely important first step to ensure success of the case. The wax-up was made to overlap the soft tissue to lengthen the teeth cervically to simulate crown lengthening. The dentist made an impression of the wax-up and then created an acrylic mock-up using a provisional restorative material (Luxatemp®, Zenith/DMG Brand Division, Foremost Dental LLC, Englewood, NJ) (Figure 3B). With the mock-up trial smile in her mouth, the patient could then see and feel what her new smile would be like on completion (Figure 3C). This ensures that the patient approves of the ceramist's vision of the final outcome. After the trial smile is approved, the periodontist can use this tool as a surgical guide for soft-tissue enhancement, and the dentist can minimally prepare the teeth—when ready—to ensure the preservation of as much enamel as possible, thereby maximizing the bonding strength of the porcelain veneers.

METHODS OF FABRICATING PROVISIONALS

While there are numerous techniques for fabricating provisionals, only two basic methods exist. They are described below.

Direct Method

In this method, a silicone mold of the wax-up is created and then filled with cold-curing acrylic and positioned in the mouth. Another direct method involves direct composite bonding to the desired shape, which requires more chairtime for the dentist.

Indirect Method

In this method, the dentist relines a prefabricated temporary shell from the wax-up design intraorally. An alternative is using a silicone mold made from the wax-up so that the provisional can be processed on the final master model with multiple layers of acrylic to create a more lifelike blueprint. This option can be cemented without a reline. Another indirect option is the laboratory fabrication of the provisionals using pre-made denture tooth facings; the back is then filled in with cold-curing acrylic, allowing the provisional to have multilayer denture teeth on the buccal aspect to create highly

Figure 5A This preoperative smile view demonstrates the shape and color of the teeth. Note that the midline is off center, and there is mild crowding.

Figure 5B The patient was not pleased with the first mock-up fabricated from a wax-up from one laboratory.

Figure 5C The second mock-up fabricated from a wax-up from another laboratory met with more favorable approval from the patient.

Figure 5D This photograph was taken with a shade guide (Natural Die Material Shade Guide) so the ceramist would know the precise foundation color of the prepared teeth.

Figure 5E View of the nine porcelain laminate veneers and one all-ceramic crown after cementation.

Figure 5F The final postoperative smile demonstrates superior esthetics that resulted in high patient satisfaction (photography courtesy of Barrett Photography, Chicago, Illinois).

attractive esthetics. Still another indirect method is laboratory-fabricated provisionals created using composite (Venus™, Heraeus Kulzer, Inc, Armonk, NY) (Figure 4A).

All of these techniques are quite simple to teach laboratory staff, dental assistants, and restorative dentists to perform. For instance, a restorative dentist fabricated a multilayer provisional using a cold-curing acrylic (New Outline, Microstar Dental, LLC, Lawrenceville, GA) to maximize esthetics and produce a three-dimensional result (Figure 4B). These techniques also can be applied directly chairside by the restorative dentist.

It is important for the restorative dentist to try the wax-up in the mouth via a mock-up before tooth preparation. Consider a young patient who was unhappy with his smile and the shape and color of his teeth (Figure 5A). The midline was off and he had mild crowding. The restorative dentist fabricated the mock-up from the wax-up made by one of the laboratories she employs (Figure 5B). The patient was unhappy with the potential outcome from that particular laboratory. The preoperative model was sent to a different laboratory, and the ceramist himself did another wax-up (Figure 5C). This wax-up was tried in the mouth via a mock-up (Figure 5C). After the patient's approval was secured, the teeth were prepared with the mock-up in place as a guide to preserve as much enamel as possible and facilitate better bonding of the final porcelain veneers. A photograph was taken with a shade guide (Natural Die Material Shade Guide, Ivoclar Vivadent, Inc, Amherst, NY) so that the ceramist would know the precise foundation color of the prepared teeth so that compensation for the dark striation could be layered with the patient's desired, natural-looking bleach shade (Figure 5D).

After the teeth were prepared, the provisionals were fabricated with the same silicone mold as the mock-up to ensure that the shape would be the same as the wax-up. During the several days that the patient wore the provisionals, he was encouraged to communicate his likes and dislikes to the dentist and laboratory. This verbal communication and the study models of the temporaries were used when creating the final veneers.

Nine porcelain laminate veneers and one all-ceramic crown were fabricated using a porcelain material (Venus™ Porcelain, Heraeus Kulzer, Inc) and then bonded into place (Figure 5E). The patient was so excited and pleased with the outcome of his maxillary restorations that he planned to restore the lower teeth with porcelain laminate veneers, also. The midline shift was not visible even though it existed because of the shaping of the incisal edges, especially on the midline between the two central incisors (Figure 5F).

CONCLUSION

When communicating about esthetics, there are some simple recommendations that can help all members of the dental team achieve success.

- A diagnostic wax-up, a mock-up, and provisionals should always be used for patient communication.
- The patient should never be rushed when discussing his or her case.
- The dental professional should not attempt to convince the patient of what is esthetic based on his or her own personal preferences. The fact that a dental professional may favor a certain style does not mean that the patient necessarily will. It is the patient's smile, and he or she is the one who will be wearing it.
- Just like their smiles, patients are unique. Dental professionals should never assume anything; doing so is always the prelude to failure. Synergy between all the key players—the patient, periodontist, general dentist, prosthodontist, orthodontist, and ceramist—should be a prerequisite for treatment and will help integrate communication for ultimate success.

Understanding each restorative option and its limitations is the key to realizing patient expectations. Clinical mastery depends mainly on the expertise of the dental team, as well as the restorative materials chosen. To achieve success, all members of the restorative team must work together using the same set of guidelines and protocols.

DISCLOSURE

Pinhas Adar, MDT, CDT, is active in the clinical research of esthetic restorative materials, implant restorative materials, and other new product developments. Because of this, he serves as a consultant, lecturer, and researcher in many clinical and laboratory studies, as well as product evaluations sponsored through contractual relationships with different corporations and universities, including: Nobel Biocare; DENTSPLY Friadent; Brasseler USA; 3M ESPE; Bisco, Inc; GC America, Inc; Shofu Dental Corp; Microstar Dental, LLC; Heraeus Kulzer, Inc; Captek, a division of Precious Chemicals Co, Inc; Jensen Industries, Inc; Kodak Dental Systems; Sony Corp; Vident; Hu-Friedy; National Dental Network; National Lab Network; and Global Surgical Corp.

RECOMMENDED READING

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